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(54) Refrigerator door

(57) A thermally insulated refrigerator door has a niche (15) which is accessible from outside and has beverage-dispensing devices or valves (20) arranged therein. Removably arranged above the niche on the inside of the door are bottles (21) from which cooled beverage can be discharged into drinking vessels (32) placed in the niche, discharge of beverage being by way of the valves (20) actuatable from outside. The niche is lined by a moulded liner element (16) which in its ceiling has receptacles (17), which penetrate the thermal insulation of the door and in which the bottles (21), which are provided with the valves on their necks, are insertable inverted in such a manner that plungers (23) operated by levers 26 and actuating the valves (20) are accessible from the outside.

FIG. 1

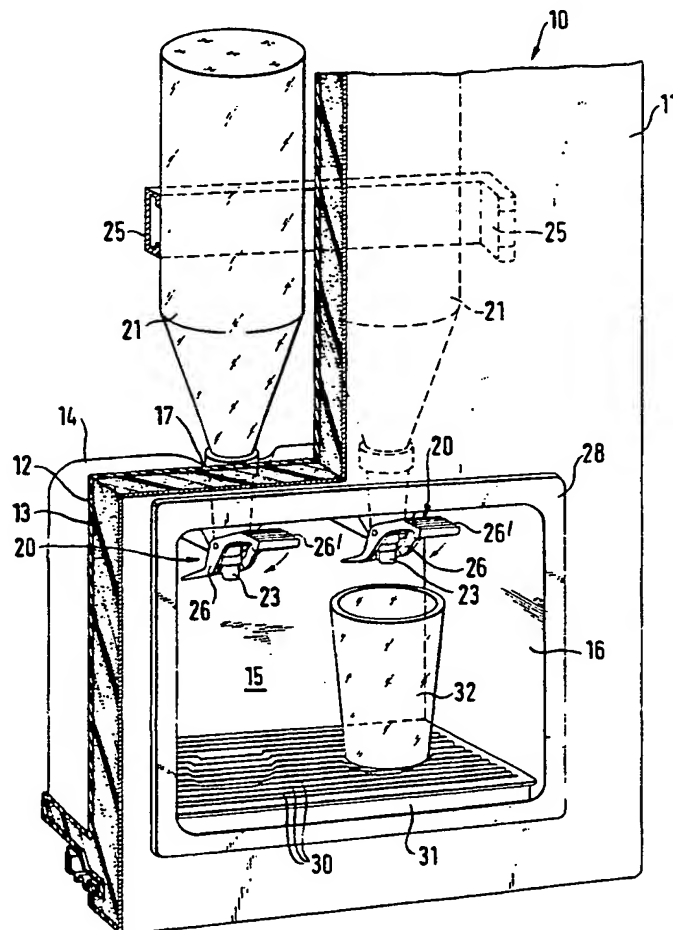


FIG. 1

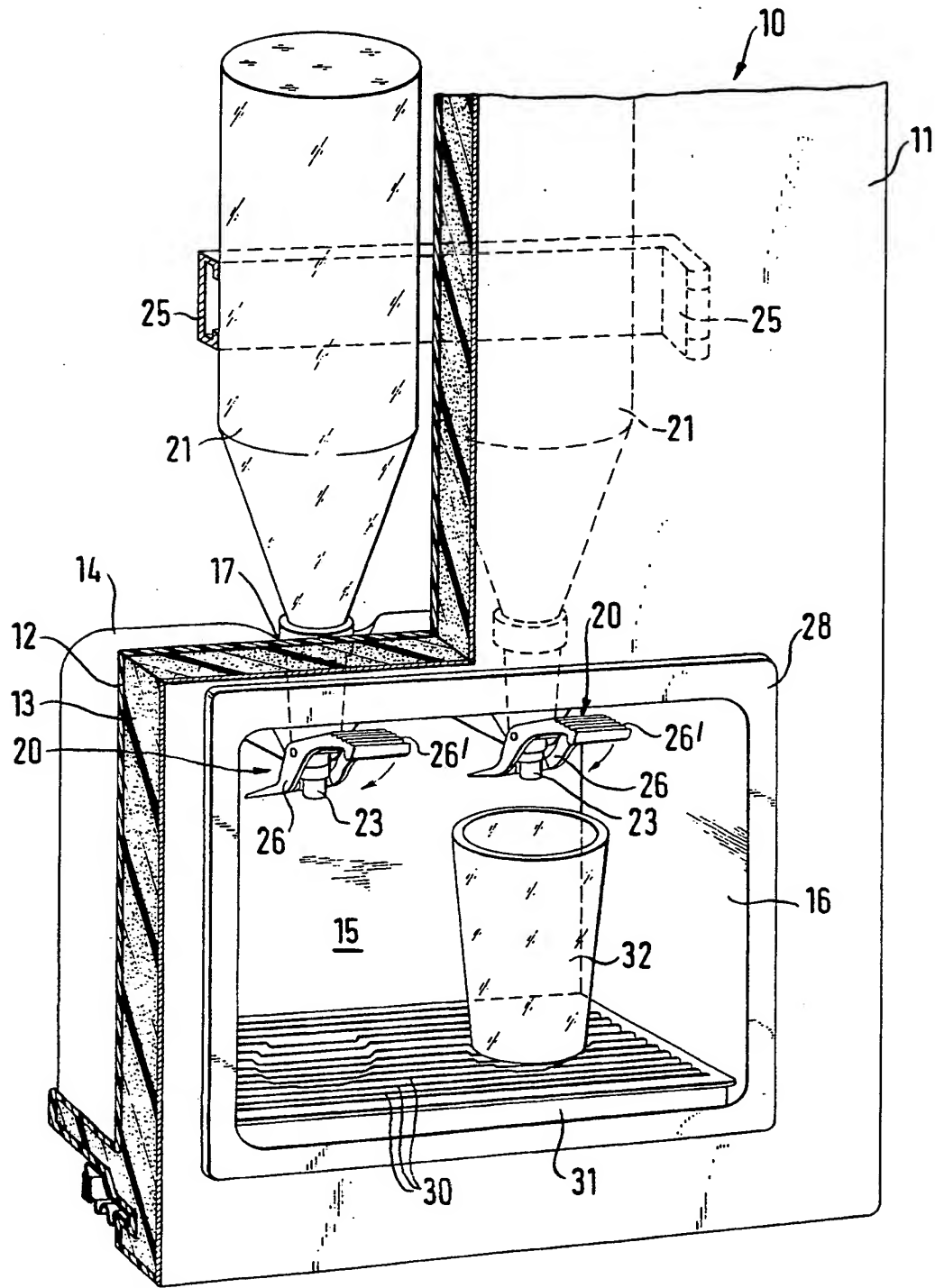
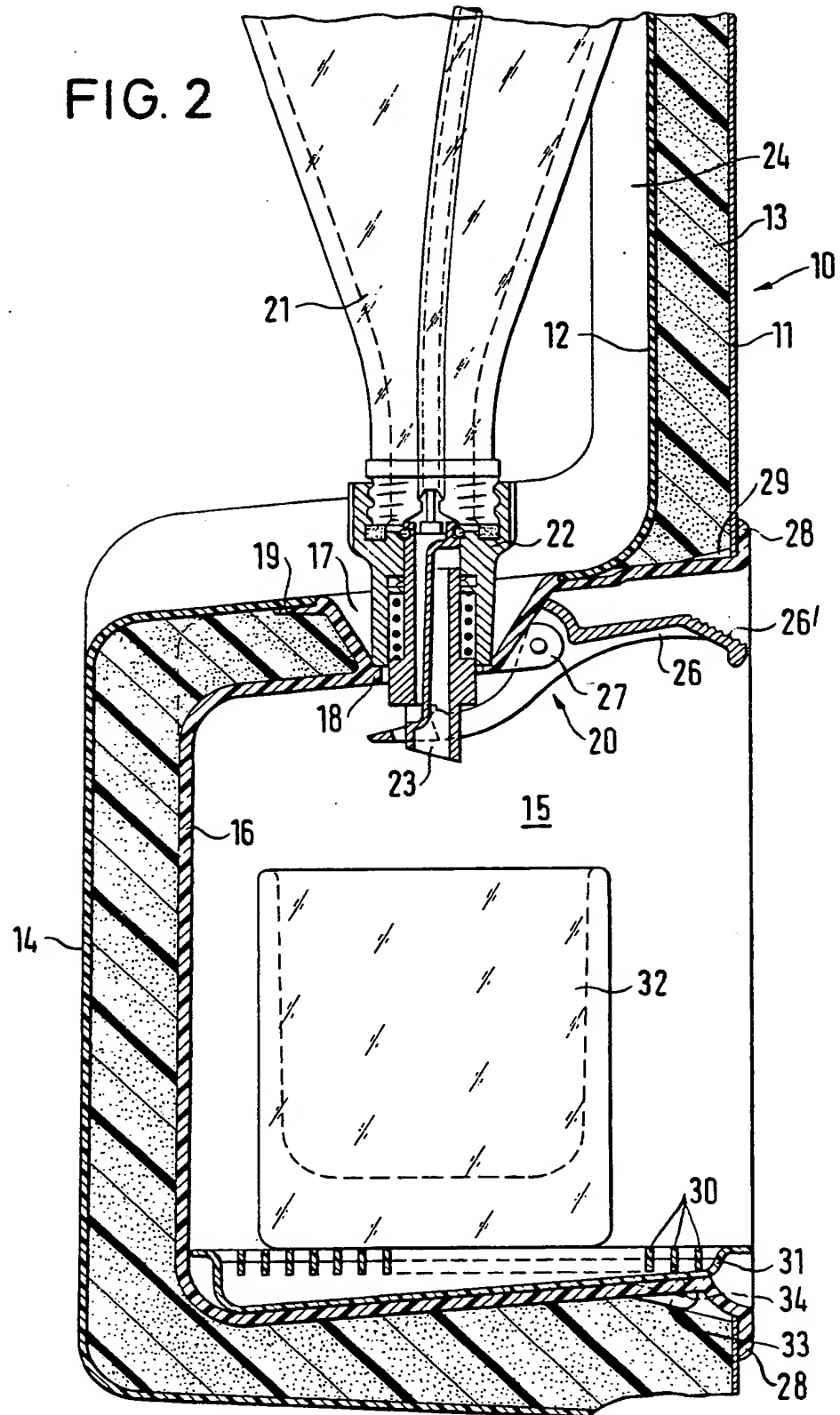


FIG. 2



REFRIGERATOR DOOR

The present invention relates to a refrigerator door.

In a refrigerator door disclosed in EP-OS 146 180 and with a beverage-dispensing device, a niche in the door is surrounded by a complicated housing which is formed from a plurality of individual parts and in which a vertically movable slide is laterally mounted. The slide is provided with a return spring and enables the free end of a tubular outlet of a storage container, which is removably arranged on the rear side of the door, to be moved up and down.

10 According to whether the mouth of this tube is set by the slide above or below the level of the liquid in the container, cooled beverage can be drawn into a drinking vessel placed in the niche and below the mouth.

This known construction of a beverage-dispensing device in a thermally insulated refrigerator door is, however, expensive to assemble and awkward to operate. Moreover, it requires the use of storage containers which must be produced specially and, in the case of replacement, may be difficult to procure. There is also the risk that contaminants in the form of yeast fungi spores and bacteria or even insects may get into the open mouth of the tube and from there into the storage container, so that the beverage stored therein spoils rapidly even with adequate cooling. The open mouth of the tube movably mounted at the storage container also creates the risk that beverage in the container may run out during the insertion or removal of the container into or from the mounting provided on the rear side of the door. It is therefore necessary to provide the tube mouth with a closure or to replenish the beverage from another vessel according

to the consumption. Insofar as the beverage reserve is only replenished, however, problems may result in respect of the hygiene regulations to be observed in the storage and the dispensing of beverages. It is therefore necessary to frequently remove the container from its mounting for thorough cleaning before refilling and refitting.

There is thus a need for a refrigerator door with a beverage-dispensing facility which is as simple as possible and easy to operate and keep clean.

According to the present invention there is provided a thermally insulated refrigerator door provided with a recess in an intended exterior face thereof and with a hollow liner element which is arranged in the recess and provided in a roof portion thereof with a receptacle for a dispensing valve of a liquid storage container mountable in an inverted position above the recess at an intended interior face of the door, the receptacle defining an opening extending through the door to permit actuation of such valve from said exterior face for discharge of liquid from the container and into the space bounded by the liner element.

In a preferred embodiment the recess is accessible from outside and has a beverage-dispensing device arranged therein. At least one liquid storage container can be withdrawably arranged above the recess on the inside of the door and cooled beverage, for example, can be discharged into a drinking vessel or the like, that can be placed in the recess, by means of the valve. The recess is lined by a moulded part sitting in a rearwardly hollowed-out portion of the door in its thermal insulation. At its ceiling the liner element has at least one receptacle, which penetrates the thermal insulation and in which

a bottle, which serves as the storage container and is provided with a valve on its neck, is insertable inverted in such a manner that a plunger actuating the valve and the valve outlet are accessible from outside.

5 The beverage-dispensing device with these features is not only simple to assemble in a thermally insulated door, but also, by reason of the use of a valve on the neck of the bottle, permits the use of commercially available bottles as storage containers. Consequently, any problems connected with keeping the storage containers clean are
10 avoided, since each bottle, after emptying of its contents, can be replaced in simple manner by a fresh and full bottle.

 Preferably, the receptacle is constructed, at the moulded part forming the liner element, as an extension which sits at the upper side of the element and is enlarged upwardly in funnel shape. At
15 the constricted exit of the receptacle, there is an annular shoulder for support of the valve placed on the bottle. By means of a moulded part constructed in such a manner, the assembly of the refrigerator door is greatly simplified and the insertion or exchange of bottles serving as storage container on the rear side of the door is also
20 simplified.

 A particularly simple operation of the beverage-dispensing device in the refrigerator door may result if a handle, which is to be operated from the front side of the door and by means of which a plunger of the valve is actuable, is arranged at the underside of the receptacle.

25 This handle is preferably constructed as double-armed lever, which is mounted near the outlet of the receptacle and one arm of which serves as an operating key while the other arm is arranged to

be able to act on the plunger of the valve.

An embodiment of the present invention will now be more particularly described by way of example with reference to the accompanying drawings, in which:

5 Fig. 1 is a partly-sectioned perspective view of a thermally insulated refrigerator door embodying the invention, showing a beverage-dispensing device accessible from outside and storage bottles arranged on the rear side of the door; and

10 Fig. 2 is a vertical section, to an enlarged scale, of the lower portion of the door.

Referring now to the drawings, there is shown a thermally insulated refrigerator door 10 provided with an external sheet metal cladding 11, an internal synthetic material, for example plastics, cladding 12, and a thermal insulation layer 13 of hard synthetic material foam therebetween. The internal cladding 12 is provided, laterally in its lower region, with a rearwardly directed projection 14, in which a recess or niche 15, accessible from the outside, is present. The niche 15 is lined by a moulded liner element 16, which sits in the thermal insulation and at the upper side has two receptacles 17 penetrating the thermal insulation. These receptacles 17 are each formed as an extension which is enlarged upwardly in funnel shape and, at its constricted exit disposed below, has an annular shoulder 18 protruding inwardly. Disposed at the enlarged upper inlet of each receptacle 17 is an outwardly protruding annular shoulder 19, which serves as a support for the rim of a circular opening in the cladding 12.

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Associated with the niche 15 are two dispensing devices which are accessible from the outside and by which cooled beverage can be drawn by means of valves 20 from storage containers which are removably arranged on the inside of the door 10 and which have the form of commercially available types of beverage bottles 21. Each valve 20 in the illustrated embodiment is screwed by a screw thread onto the correspondingly threaded neck of the bottle 21. The bottle, with the valve 20 firmly connected thereto in this manner, is inserted inverted from above into the associated receptacle 17 in such a manner that an outer rim of a body 22 of the valve 20 is supported on the annular shoulder 18. In that case a plunger 23, which is arranged in the body 22 of the valve 20 and which in the illustrated embodiment also serves as an outlet nipple, protrudes downwardly through the receptacle 17 and into the niche 15.

In the use position, the bottle 21 is supported laterally in a depression 24 extending vertically on the inside of the door 10 and is firmly clamped in place by a clamping bracket 25 (see Fig. 1) disposed on the rear side of the door 10 and extending across the depression in about its middle region.

Arranged at the underside of each receptacle 17 is a handle 26, which is operable from the front side of the door 10 and by means of which the valve plunger 23 is actuatable. The handle 26 is constructed as a double-armed lever, which is pivoted near the lower exit of the receptacle 17 at eyelets 27 moulded thereon and the forward lying arm of which is constructed as an operating key 26', whilst the rearwardly extending arm is capable of acting on the plunger 23.

The moulded part 16 is provided around its opening with a flange

28 which in the assembled state of the door bears against the rim of the opening in the external cladding 11. Disposed behind the flange 28 are a plurality of spaced apart lugs 29 which, on insertion of the part 16, detent behind the rim of the opening in the cladding 11 and thus fix the part 16 in position.

The bottom of the part 16 slopes down rearwardly and serves for the reception of a drip tray 31 equipped with ribs 30. The adjacent upper spines of the ribs 30 form a base for a drinking vessel 32 that can be placed below the dispensing device 20 in the niche 10. The bottom of the part 16 is provided at its rim facing the opening with depressions 33, into which engage claws 34 protruding downwardly from the bottom of the drip tray 31 and near the front edge thereof. In this manner, the drip tray 31 is firmly retained in the part 16, so as to be securely held in position even in the case of violent opening and shutting of the door.

The part 16 expediently consists of a one-piece moulded plastics body with integral flange 28, lugs 29, receptacles 17 and shoulders 18 and 19.

CLAIMS

1. A thermally insulated refrigerator door provided with a recess in an intended exterior face thereof and with a hollow liner element which is arranged in the recess and provided in a roof portion thereof
5 with a receptacle for a dispensing valve of a liquid storage container mountable in an inverted position above the recess at an intended interior face of the door, the receptacle defining an opening extending through the door to permit actuation of such valve from said exterior face for discharge of liquid from the container and into the space
10 bounded by the liner element.

2. A door as claimed in claim 1, wherein the receptacle is provided by an upwardly enlarging funnel-shaped extension on the roof portion of the liner element, the opening defined by the receptacle being bounded at its smallest diameter by an annular shoulder for support
15 of the valve.

3. A door as claimed in either claim 1 or claim 2, wherein the liner element is provided with a handle operable from said exterior face of the door to actuate such valve.

4. A door as claimed in claim 3, wherein the valve is a plunger
20 valve and the handle is a double-armed lever pivotably mounted on the underside of the roof portion of the liner element in the region of the opening of the receptacle, one arm of the lever being arranged to serve as an operating key and the other arm of the lever being arranged for actuation of a plunger of such valve.

5. A door as claimed in any one of the preceding claims, wherein the liner element comprises a peripheral flange lying against the surface portion of said door exterior face around the recess.

6. A door as claimed in any one of the preceding claims, comprising
5 a ribbed drip tray arranged on a floor portion of the liner element to provide a support for a vessel to receive such discharged liquid.

7. A door as claimed in claim 6, wherein said floor portion slopes downwardly in direction into the recess and is provided with depressions receiving locating lugs on the tray.

10 8. A refrigerator door substantially as hereinbefore described with reference to the accompanying drawings.

9. A refrigerator comprising a door as claimed in any one of the preceding claims.

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